BMP #135 - Silt Fence

DESCRIPTION

A silt fence is a temporary sediment barrier consisting of a filter fabric stretched and attached to supporting posts. (Wire fence backing is necessary with several types of filter fabric commonly used.) Silt fences assist in sediment control by retaining some of the eroded soil particles and slowing the runoff velocity to allow particle settling.

Targeted Pollutants

- ● Sediment
- ○ Phosphorus
- ○ Trace metals
- ○ Bacteria
- ○ Petroleum hydrocarbons

Physical Limits

Drainage area	1 ac/100 ft
Max slope	33%
Min bedrock depth	2 ft
Min water table	2 ft
SCS soil type	ABCD
Freeze/Thaw	good
Drainage/Flood control	no

APPLICATION

Silt fences can be used near the perimeter of a disturbed area to intercept sediment while allowing water to percolate through. The fences should remain in place until the disturbed area is permanently stabilized.

Silt fences can also be used along the toe of fills, on the downhill side of large through-cut areas, along streams, and at natural drainage areas to reduce the quantity of sediment and to dissipate flow velocities to downstream areas.

Also use at grade breaks on cut/fill slopes and above interceptor dikes.

The silt fence should be constructed after the cutting and slashing of trees and before excavating haul roads, fill benches, or any soil disturbing construction activity in the drainage areas.

LIMITATIONS

Silt fences should not be used where there is a concentration of water in a channel or drainageway or where soil conditions prevent the minimum fabric toe-in depth or minimum depth for installation of support posts. If concentrated flow occurs after installation, take corrective action by placing rock berms or other corrective measures in the areas of concentrated flow.

DESIGN PARAMETERS

Maximum allowable slope lengths: Maximum allowable slope lengths contributing runoff to a silt fence are listed in the table below:

Slope Steepness	Maximum Slope Length (Feet)

2:1	50
3:1	75
4:1	125
5:1	175
Flatter than 5:1	200

Maximum drainage area: Maximum drainage area for overland flow to a silt fence shall not exceed ½ acre per 100 feet of fence

Design Calculations: Design computations are not required. All silt fences shall be placed as close to the contour as possible, and the area below the fence must be undisturbed or stabilized.

Site Plan Details: A detail of the silt fence shall be shown on the plan, and contain the following minimum requirements:

- The type, size, and spacing of fence posts.
- The size of woven wire support fences.
- The type of filter cloth used.
- The method of anchoring the filter cloth.
- The method of fastening the filter cloth to the fencing support.

Joining Filter Fabric: Where ends of filter fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.

Materials:

Silt Fence Fabric**:** The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute statewide acceptance. Statewide acceptability shall depend on in-field and/or laboratory observations and evaluations.

Fabric Properties	Value	Minimum Acceptable Test Method
Grab Tensile Strength (lbs)	90	ASTM D1682
Elongation at Failure (%)	50	ASTM D1682
Mullen Burst Strength (PSI)	190	ASTM D3786
Puncture Strength (lbs)	40	ASTM D751 (modified)
Equivalent Opening Size	40-80	US Std Sieve CW-02215

Ultraviolet Radiation Stability %	90	ASTM-G-26

Fence Posts (for fabricated units): The length shall be a minimum of 36 inches long. Wood posts will be of sound quality hardwood with a minimum cross sectional area of 3.0 square inches. Steel posts will be standard T and U section weighing not less than 1.00 pound per linear foot.

Wire Fence (for fabricated units): Wire fencing shall be a minimum 14¼ gage with a maximum 6" mesh opening, or as approved.

Prefabricated Units: Envirofence or approved equal may be used in lieu of the above method providing the unit is installed per manufacturer's instructions.

CONSTRUCTION GUIDELINES

- Posts should be spaced 10 ft (3 meters) apart when a wire mesh support fence is used and no more than 6.5 ft (2 meters) apart when using extra-strength filter fabric (without a wire fence). The posts should extend at least 16 in (0.4 meter) into the ground.
- If standard strength filter fabric filter is to be used, fasten the optional wire mesh support fence to the upslope side of the posts using heavy duty wire staples, tie wires, or hog rings. Extend the wire mesh support to the bottom of the trench. The filter fabric should then be stapled or wired to the fence.
- Extra strength filter fabric does not require a wire mesh support fence. Staple or wire the filter fabric directly to the posts.
- Do not attach filter fabric to trees!
- Where joints in the fabric are required, splice it together only at a support post, with a minimum 6 in (150 mm) overlap, and securely seal the joint.
- Embedded filter fabric should extend in a flap which is anchored by backfill, to prevent fabric from pulling out of ground.

MAINTENANCE

Silt fences should be inspected periodically for damage (such as tearing by wind, animals, or equipment) and for the amount of sediment which has accumulated. Remove the sediment when it reaches one-half the height of the silt fence. In situations where access is available, machinery can be used. Otherwise, the silt must be removed manually. The key elements to remember are:

- The sediment deposits should be removed when heavy rain or high water is anticipated.
- The sediment deposits should be placed in an area where there is little danger of erosion.

- The silt fence should not be removed until adequate vegetative growth ensures no further erosion of the slopes. Generally, the fabric is cut at ground level, the wire and posts are removed, then the sediment is spread, seeded, and protected (mulched) immediately.